REMARKS

Reconsideration of the pending application is respectfully requested in view of the following observations.

1. In the specification

The amendment to the specification is submitted to add appropriate section headings.

No new matter is entered by way of the amendment to the specification.

Entry of the amendment to the specification is kindly requested.

2. In the claims

Claims 1, 2, 15, 18, 19, 21, 22, 29, and 31 have been amended.

Claim 1 has been amended to recite "repeatedly performing the steps of transforming the intensity profile into at least one analog electrical signal and of transforming said analog electrical signal into at least one digital signal with an intensity domain comprising intensity values and a space domain comprising discrete positions for the same subarea to form different digital signals with different intensity discretizations in each case." Support for this amendatory language may be found at least in paragraphs [0011] to [0015] of the specification.

Claim 15 has been amended to recite "normalizing the intensity domains of the digital signals to the portion of the continuous intensity domain detected in the respective digital signal" to correct indefinite language identified in the Office action.

Claim 21 has been similarly amended to claim 1 to recite "a control device which causes the transformation device and the analog/digital converter to perform for the same subarea, the transforming of the intensity profile into at least one analog electrical signal and the transforming of the analog electrical signal into at least one digital signal with an intensity domain comprising discrete intensity values and a space domain comprising discrete positions for the same subarea repeatedly to form different digital signals with different intensity discretizations in each case." Support for this amendatory language may be found at least in paragraphs [0011] to [0015] of the specification.

Claim 29 has been amended to recite "normalize the intensity domains of the digital signals to the portion of the continuous intensity domain detected in the respective digital signal" to correct indefinite language identified in the Office action.

Claims 1, 2, 15, 18, 19, 21, 22, 29, and 31 have also been amended to change references to "the plurality of digital signals" to "the digital signals."

The claims are now considered to be placed in condition for allowance.

No new matter is introduced via the amendment to the claims.

Entry of the amendment to the claims is kindly requested.

3. Objection to Drawings

The drawings were objected to for not showing the normalization feature recited in claims 15 and 29.

It is submitted, however, that the feature of normalizing the intensity domains of the digital signals to the portion of the continuous intensity domain detected in the respective digital signal is implicitly shown in Fig. 1 by the DS1 and DS2 values being correlated to the appropriate portion (A1, A2) of the continuous intensity domain. Further, since the normalizing feature is a method step there is not a reasonable way of explicitly showing such a mathematical operation in a schematic drawing.

Therefore, withdrawal of the objection to the drawings is kindly requested.

4. Rejection of claims 2, 15, and 29 under 35 USC 112, 2nd paragraph

Claim 2 is rejected for the unclear language of "different portions of the continuous intensity domain."

It is clear from claim 1 and the specification as well as Fig. 1 that the continuous intensity domain is the range of discrete intensity values of the intensity profile. Claim 1 recites that an intensity profile has a continuous intensity domain comprising discrete intensity values. Further, paragraph [0038] of the specification describes A1 and A2 to be portions of the continuous intensity domain (KI). As supported by Fig. 1, A1 and A2 are different sections of the range of intensity levels covered by the continuous intensity domain (KI). Therefore, based on claim 1, the specification, and Fig. 1, it is clear that the "different

portions of the continuous intensity domain" are different sub-ranges covered by the overall continuous intensity domain.

Claims 15 and 29 have been amended to clarify that the normalization of the intensity domains of the digital signals is of the intensity domain detected in the respective digital signal.

Therefore, withdrawal of the rejection of the claims is kindly requested.

5. Rejection of claims 1-12, 15, 16, 21-26, 29, and 30 under 35 USC 103(a) over US patent 6,259,804 (*Setlak*) in view of US publication 2002/0057845 (*Fossum*)

Reconsideration of the rejection is respectfully requested in view of the amendment to the claims and the following observations.

Amended claim 1 recites a method for digitizing a subarea of the papillary structure of skin, the subarea defining an intensity profile with a continuous intensity domain. The method includes the steps of transforming the intensity profile into at least one analog electrical signal, and transforming the analog electrical signal into at least one digital signal with an intensity domain comprising discrete intensity values and a space domain comprising discrete positions. Both of these transforming steps are then repeatedly performed for the same subarea to form different digital signals with different intensity discretizations in each case. These digital signals are then combined into a common digital papillary structure signal with an intensity domain formed from discrete intensity values and a space domain formed from discrete positions in such a way that the intensity domain of the papillary structure signal has more intensity values than the intensity domains of each single one of the different digital signals.

As discussed in paragraph [0011], the local contrast resulting from the papillary structure of a fingerprint profile is transformed into an analog electrical signal, which is then transformed into a digital electrical signal. Then, a plurality of recordings is made of a fingerprint to be recorded which all image the same subarea of the papillary structure of the skin (see paragraph [0013]). As a result, the recordings have the same image content structurally but differ quantitatively in the representation of the content by discrete intensity values. Therefore, in each transformation from an analog to a digital signal a different number of discretizations (quantization levels) are used (see paragraph [0014]). Since the

more discretizations are used, the more precise the analog to digital transformation, each repeated transformation results in digital signals with different levels of precision.

It is submitted that the rejection fails to establish a *prima facie* case of obviousness based on the proposed combination of *Setlak* and *Fossum*. *Setlak* in view of *Fossum* fails to teach or suggest all of the features of amended claim 1.

Neither *Setlak* nor *Fossum* discloses repeatedly transforming the intensity profile and the analog electrical signal for the same sub area to form different digital signals with different intensity discretizations in each case.

Setlak is directed to a fingerprint sensor with a bank of A/D converters (180) which can be controlled by a gain processor (185). The gain processor (185) provides range determining and setting means for controlling the range of the A/D converters (180) based upon prior A/D conversions to enhance conversion resolution. The conversion resolution of prior A/D conversions is enhanced by having the gain processor (185) generate a histogram plot (191). The histogram is then used to determine the ridges and valleys of the fingerprint to set the range for the A/D converters (180) such that the full resolution of the A/D converters (180) can be used (see col. 11, lines 1-25).

Setlak does not repeatedly perform an A/D conversion for the same subarea where each conversion results in multiple digital signals with different intensity discretizations in each case. *Setlak* merely uses the previous A/D conversions to calibrate the range of the A/D converters to make use of their full resolution range. *Setlak* does not disclose that the previous A/D conversions have different discretizations from the each other or the current A/D conversion as required by amended claim 1. Moreover, *Setlak* does not disclose that the repeated transformation is applied to the same subarea of the fingerprint.

Furthermore, *Setlak* does not disclose that combining these different digital signals are combined into a common digital signal. The previous A/D conversions are not used in combination with a subsequent A/D conversion to produce a common digital signal. The A/D conversion produced with the full resolution range does not incorporate any of the previous A/D conversions. Thus, *Setlak* fails to disclose repeatedly performing an A/D conversion for the same subarea where each conversion results in different digital signals with different intensity discretizations in each case and combining these different digital signals into a common digital signal.

Moreover, *Fossum* does not cure the deficiencies of *Setlak*. First, *Fossum* does not teach repeatedly transforming the intensity profile into at least one analog electrical signal and transforming the analog electrical signal into at least one digital signal for the same subarea to form different digital signals with different intensity discretizations.

Fossom is directed to increasing the dynamic range of a sensor by amplifying each pixel signal level with two different gains to produce two output signal levels. The two output signal levels are then combined to form a new signal level, which has the effect of an increased dynamic range of system (see paragraph [0033]).

The photoreceptor array (21) detects the photons from the micro-lenses (12) or the color filter array (13). The receptor converts the photons into signals which is then selectively sent to the readout circuitry (25) (see paragraph [0031]). The readout circuitry (25) contains a readout stage (251) and a gain stage (252). The two different gains are then applied in the same stage to this single signal. In *Fossum*, the data from the sensor is only captured once. Thus, the sensor data is not repeatedly transformed into an analog electrical signal which is in turn transformed into a digital signal.

Further, since *Fossum* does not disclose repeatedly transforming the intensity profile into an analog signal, *Fossum* cannot also disclose subsequent step of transforming this analog signal into different digital signals with different intensity discretizations in each transformation.

In contrast, the instant application a physical signal which may be the local contrast resulting from the papillary structure of a fingerprint profile is transformed into an analog electrical signal which is then transformed into a digital signal (see paragraph [0011]). It is advantageous to repeatedly perform both of these transformation steps since it allows the increase of the intensity resolution of the readout from conventional detectors and A/D conversion units based merely on a software solution.

Accordingly, the proposed combination of *Setlak* and *Fossum* fails to disclose all the features of amended claim 1.

Amended claim 21 recites similar features to those in amended claim 1 and is likewise allowable at least for the reasons above. Moreover, claims 2-10, 11, 12, 15, 16, 22-26, 29, and 30 depend from claim 1 or 21 and are allowable in view of their dependency from claim 1 or 21 and their individually recited features.

Withdrawal of the rejection of the claims in view of the prior art is kindly requested.

6. Conclusion

As a result of the amendment to the claims, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that every pending claim in the present application be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

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Respectfully submitted,

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